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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/049,270	06/27/2002	Hui Zhong	Q68281	9445

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SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER

DINH, TUAN T

ART UNIT PAPER NUMBER

2841

DATE MAILED: 08/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/049,270	Applicant(s) ZHONG ET AL	
	Examiner Tuan T. Dinh	Art Unit 2841	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9,31-34 and 36-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9,32,34,36,39-40 is/are allowed.
- 6) ☒ Claim(s) 31,33,37 and 38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date, _____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>05/08/06</u> . | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 31, 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reed (U.S. Patent 4,211,603) in view of Kenji et al. (JP 05-39345) submitted by applicant.

As to claim 31, Reed discloses a multilayered printed circuit board as shown in figures 1-4 comprising:

a conductor circuit (12) and a resin insulating layer (22) serially formed on a substrate (16) in alternate fashion and in repetition; and

a solder resist layer (46) formed as an outermost layer, see figure 4.

Reed does not disclose said solder resist layer (46) containing a P-atom containing epoxy resin, the P-atom containing epoxy resin having bivalent phosphoric acid residue with a hydroxyl group, and having epoxy group in both terminals of the P-atom containing epoxy resin.

Kenji et al. teaches a phosphorus (P) containing epoxy resin, the epoxy resin having bivalent phosphoric acid residue with a hydroxyl group (phenyl group), and

having epoxy group in both terminals of the P-atom containing epoxy resin as shown in formulas 2-3.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ a solder resist composition containing a P-atom containing epoxy resin as taught by Kenji et al. to modify the solder resist of Reed for the purpose of providing a heat resistance suitable on the surface of the PCB.

As to claim 33, Reed discloses all of the limitation of the claimed invention, except for a P-atom containing epoxy resin having mono-valent phosphoric acid residue with two hydroxyl groups (phenyl group) in one terminal of the P-atom containing epoxy resin, and an epoxy group in the other terminal of the P-atom containing epoxy.

Kenji et al. teaches a phosphorus containing epoxy resin, the epoxy resin having bivalent phosphoric acid residue with two hydroxyl groups (phenyl group), and having epoxy group in both terminals of the P-atom containing epoxy resin as shown in formulas 4-6.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ a solder resist composition containing a P-atom containing epoxy resin as taught by Kenji et al. to modify the solder resist of Reed for the purpose of providing a heat resistance suitable on the surface of the PCB.

3. Claims 37-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reed ('603) in view of Kenji (JP 05-39345) as applied to claims 31 and 33 above, and further in view of Myamura ('378).

Regarding claims 37-38, Reed and Kenji disclose all of the limitations of the claimed invention, except for the solder resist containing at least one member selected from the group consisting of silicon, Al, and Mg compounds.

Myamura shows a solder resist containing a silica or alumina, see column 5, lines 39-45.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a teaching of Myamura employed in the circuit board of Reed and Kenji in order to provide heat resistances, and surface hardness suitable on a surface of a circuit board.

Allowable Subject Matter

4. Claims 9, 32, 34, 36, and 39-40 are allowed.

The following is an examiner's statement of reasons for allowance: the references cited disclose a multilayered PCB comprising a conductor circuit, a resin insulating layer, a solder resist layer, and some other claim elements. However, they do not disclose or render obvious in combination of the PCB comprising the solder resist having an elastomer component being separated in micro-phase as to form an island in-sea structure after curing in the solder resist (claims 9, 36), the epoxy resin having the following formulas (4) and (5), (claims 32, 34).

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

Applicant's arguments filed 12/02/05 have been fully considered but they are not persuasive.

Applicant argues:

(a) The combination of Reed in view of Kenji is not proper because, the Kenji reference does not show "the P-atom containing epoxy resin having bivalent phosphoric acid residue with one or two hydroxyl groups."

Examiner disagrees because:

First, the epoxy resin is widely used for an insulating material, and **the hydroxyl group** is so broad and it is well defined as a phenyl group (OH). The Kenji reference as disclosed an epoxy resin having formulas (2)- (6) that teaches the epoxy resin containing a P-atom containing epoxy resin with a (one) hydroxyl group (formula 2), and formulas (4) –(6), the epoxy resin having two phenyl groups.

Since Kenji does teach (as explained as above) the P-atom containing epoxy resin.

Thus, the examiner believes the rejection based on the combination of Reed in view of Kenji is proper.

(b) The combination of Reed, Kenji, and Myamura fail to disclose the limitations of claims 37-40.

Examiner disagrees because: as recited in claims 31 or 33, line 4 that the solder resist contains P-atom containing epoxy resin, so the solder resist is widely used for the insulating material and the term "contain", which is equivalent to "comprise" and open phrase. Reed and Kenji disclose all of the limitations of the claimed invention, except for the solder resist containing (further comprising) at least one member selected from the group consisting of silicon, Al, and Mg compounds.

Myamura shows a solder resist containing a silica or alumina, see column 5, lines 39-45.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a teaching of Myamura employed in the circuit board of Reed and Kenji in order to provide heat resistances, and surface hardness suitable on a surface of a circuit board.

Since claim 39-40 are depended on allowable claims (claims 32, 34), so claims 39-40 are allowable now (just claims 37-38 are rejected).

Thus, the examiner believes the rejection based on the combination of Reed in view of Kenji, and further in view of Myamura is proper.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

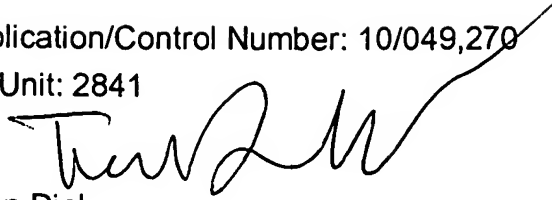
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T. Dinh whose telephone number is 571-272-1929. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kammie Cuneo can be reached on 571-272-1957. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Application/Control Number: 10/049,270

Art Unit: 2841

A handwritten signature in black ink, appearing to read 'Tuan Dinh', with a long, sweeping horizontal line extending to the right.

Tuan Dinh

July 31, 2006.